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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/402,751 | 10/12/1999 | HENNING HENNINGSSEN | 4359-5-PCT | 6390 |

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| EXAMINER |
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LIANG, REGINA

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| ART UNIT: | PAPER NUMBER |
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2629

DATE MAILED: 08/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 09/402,751 | Applicant(s) HENNINGSEN, HENNING | |
| | Examiner Regina Liang | Art Unit 2629 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is responsive to amendment filed 7/5/06. Claims 1-22 are pending in this application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1, 3, 4, 8, 14, 15, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori et al (US. PAT. NO. 5,765,934 hereinafter Okamori) in view of Sonehara et al (US. PAT. NO. 5,053,765 hereinafter Sonehara).

As to claim 1, Fig. 2 of Okamori discloses an illumination unit for point illumination of a medium comprising a plurality of light emitter (216b-216e) comprises of light guides (light-branching guide is formed of a bundle of optical fibers, col. 8, lines 44-52) arranged to illuminate an illumination face (using a projection lens 8 to project the image on a screen 10, the screen 10 is shown in Fig. 7, the screen 10 corresponds to an illumination face) via a light valve arrangement (light valves 61-64), each of at least two of the light emitters being arranged to illuminate a light valve arrangement (e.g., light guide 216b is arranged to illuminate light valve 61, light guide 216c is arranged to illuminate light valve 62).

Okamori does not explicitly disclose the light valve arrangement comprising a plurality of electrically controlled light valves.

However, Sonehara teaches a light valve arrangement comprising a plurality of electrically controlled light valves (see Figs. 7, 8, an LCD serves as light shutter (light valve

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arrangement), each light shutter comprising a plurality of electrodes 706 or 806 corresponds to a plurality of picture elements, see col. 6, lines 15-25, col. 7, lines 20-28; the plurality of picture elements correspond to a plurality of electrically controlled light valves as claimed). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the light valve arrangement of Okamori to have a plurality of electrically controlled light valves as taught by Sonehara so as to provide an improved light guide type display device which provides a uniform and high quality display (col. 2, lines 25-27 of Sonehara).

As to claim 3, Fig. 2 of Okamori teaches a micro lens (projecting lens 8) arranged between the light valves (61) and the illumination face (10 in Fig. 7).

As to claim 4, Okamori teaches the optical light comprises optical fibres (col. 8, lines 50-51).

As to claim 8, Fig. 2 of Okamori teaches a collimation lens (14d) arranged between the light emitter (216b) and the face shape of the light valves (61).

As to claim 14, Okamori teaches an optical means (projecting lens 8) arranged between the light valve arrangement (61) and the illumination face (10 in Fig. 7) for spreading the light beams across the illumination face.

As to claim 15, Okamori teaches the LCD light valves.

As to claim 18, Okamori teaches light guides are arranged with respect to the light valve arrangement such that the optical energy of each area of light valves does not differ significantly from each other (see Fig. 2).

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As to claim 19, Fig. 2 of Okamori teaches light receiving ends of the light guides (216) are gathered in one bundle which directly receives light from a reflector 12 optically connected to the lamp (11).

As to claim 20, not the discussion of claim 1 above.

4. Claims 2, 5, 6, 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori and Sonehara as applied to claims 1 and 20 above, and further in view of Mizuguchi (US. PAT. NO. 5,548,349).

As to claims 2, 21, Okamori as modified by Soehara does not disclose the illumination unit having one micro lens arranged with respect to each light valve. However, Fig. 2B of Mizuguchi teaches a pixel arrangement of a display device comprising micro lens arrays (e.g., 6), each of micro lenses (6a) constituting the micro lens array has a size equal to one pixel (15) of the LCD panel (14). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the illumination unit of Okamori as modified by Sonehara to have one micro lens arranged with respect to each light valve as taught by Mizuguchi since an excellent picture can be obtained.

As to claim 5, Fig. 1 of Mizuguchi teaches the light source comprising a short arc gap lamp.

As to claim 6, Okamori as modified by Sonehara and Mizuguchi does not disclose the short arc gap lamp comprises light receiving optical light guides arranged with an angle of $\pm 75^{\circ}$ with respect to the equatorial axis of the lamp. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the short arc gap lamp of Au as modified by Mizuguchi have light receiving optical light guides arranged as

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claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As to claim 22, Fig. 2 of Okamori teaches a micro lens (projecting lens 8) arranged between the light valves (61) and the illumination face (10 in Fig. 7).

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori and Sonehara as applied to claim 1 above, and further in view of Shibuya et al (US. PAT. NO. 4,619,508 hereinafter Shibuya).

As to claim 7, Okamori as modified by Sonehara does not disclose the light source comprising a laser source. However, Shibuya teaches an illuminating optical device which uses a coherent light source such as a laser (1 in Fig. 1). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the light source of Okamori as modified by Sonehara to have a laser source as taught by Shibuya since the laser light source can accomplish illumination excellent in uniformity (col. 1, lines of Suganuma).

6. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori and Sonehara as applied to claim 8 above, and further in view of Tanaka et al (US. PAT. NO. 5,633,737 hereinafter Tanaka).

As to claim 9, Okamori as modified by Sonehara does not disclose face shape of the light valves forms one or more hexagons. Fig. 3c, of 3d of Tanaka teaches the light valves (LCD layer) having hexagonal micro-lenses such that the face shape of the light valves (pixels) forms

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one or more hexagons. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Okamori as modified by Sonehara to have hexagon shapes formed on the face shape of the light valves since this arrangement make it possible to reduce the angles made between the incident light beams of the respective colors and the optical axis of the micro-lens, thereby reducing the aberration of the micro-lens array.

As to claim 10, Fig. 3 of Tanaka shows that the pixels in the second row are offset from the first row (this corresponds to the light valves being disposed at a given mutual distance, and the rows being mutually offset in the transverse direction).

As to claim 11, Figs. 1a, 2, 4, 7 of Tanaka teaches the projection of all the individual light valves in the display screen.

7. Claims 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori and Sonehara as applied to claim 1 above, and further in view of Dwyer, III (US. PAT. NO. 5,281,960).

As to claim 12, Okamori as modified by Sonehara teaches each of bundles (e.g., 216b) is illuminating the face shape of the light valves (the output end of each bundle e.g., 262 corresponds to the illumination head). Gulick does not disclose the illumination head and the illumination face is adapted to perform a relative movement across an illumination area, and a control unit for controlling the light valves in dependence on the relative movement between the illumination head and the illumination face. However, Dwyer, III teaches a display device for generating an image on the display having a plurality of light sources (Fig. 2), the pixels provided by the light sources are imaged on the display upon a fiber optic bundle. Dwyer, III

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also discloses the device comprising an actuator for controlling the relative movement between the array of light emitting points from the fiber optic bundle and the illumination face, and the actuator relies upon the successive selection of apertures within a light valve cell to pass light from an image source (see Fig. 2, 6, 20, 21, and col. 15, lines 44-49, col. 22, line 66 to col. 23, line 68 for example). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Okamori as modified by Sonehara's illumination unit to perform a relative movement between the illumination head and the illumination face and have a control unit for controlling the light valves as taught by Dwyer, III, since the apparent resolution of the displayed image is increased without increasing the resolution or size of the display source used to generate the image (col. 4, lines 57-60 of Dwyer, III).

As to claim 13, Figs. 12 and 13 of Dwyer, III shows the movement of the light emitting point through a succession of positions (this corresponds to illumination system movable relative to the illumination face in a single progressing movement transverse to a direction).

8. Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamori and Sonehara as applied to claim 1 above, and further in view of Lee (US. PAT. NO. 3,553,364).

Okamori as modified by Sonehara does not disclose the light valves comprising electromechanical light valves. Lee teaches a electromechanical light valve device relating to light transmission or light reflection control, and more particularly to a light valve for controlling the transmission or the reflection of light by means of an electrostatic charge. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the light valves of Okamori as modified by Sonehara comprising an electromechanical

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light valves as taught by Lee so as to provide a light valve isolated from surrounding electrostatically generated forces, thereby reducing “crosstalk”. (col. 1, lines 35-36 of Lee).

Response to Arguments

9. Applicant's arguments filed 7/5/06 have been fully considered but they are not persuasive.

Applicant's remarks regarding the combination of Okamori and Sonehara on pages 7-9 are not persuasive. Okamori teaches each light guide (216b-216e) is in form of a bundle of fibers, one bundle of fibers (216b) is arranged to illuminate a light valve arrangement (61) wherein each bundle is an emitter, another bundle of fibers 216c is arranged to illuminate a light valve arrangement (62). Figs. 6-8 of Sonehara teaches one bundle of fibers is arranged to illuminate a light valve arrangement (light shutter), and the light shutter includes a plurality of electrodes (706, 806), each electrode corresponds to an electrical controlled light valve, thus, a plurality of electrodes corresponds to a plurality of electrical controlled light valves. Sonehara teaches one emitter (**one bundle of fiber**) is used to illuminate a light valve arrangement (light shutter) wherein each light shutter is made up of a plurality of electrically controlled light valves. Thus, Okamori as modify by Sonehara have one bundle of fibers (**each of the light emitters**) being arranged to illuminate a **plurality** of light valves as claimed.

Applicant's remarks on page 10 are not persuasive. Sonehara is relied upon to show that the light valve arrangement comprises a plurality of electrical controlled light valves and when Okamori is modify by Sonehara would comprise a light valve arrangement comprises a plurality of electrical controlled light valves that's illuminated by a single emitter thus rendering the claim

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obvious. Furthermore, Okamori clearly teaches a plurality light emitters comprised of light guides as claimed, thus the combination of Okamori and Sonehara renders the claims obvious and the rejection is proper.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

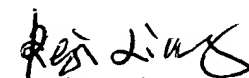
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Regina Liang whose telephone number is (571) 272-7693. The examiner can normally be reached on Monday-Friday from 8AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe, can be reached on (571) 272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Regina Liang
Primary Examiner
Art Unit 2674

8/7/06